TABLE 3. CROSSWALK FOR REQUIRED OBSERVATIONS – HAZARDS AND DISASTERS

Hazard	Wildland Fire	Earthquakes	Volcanoes Volcanic ash and aerosols	Landslides	Floods	Extreme weather	Tropical cyclones	Sea and Lake Ice	Coastal hazards, tsunami	Technological disasters (oil spills, etc.)
Required Observations/ Types of Data										
Digital topography – broad, regional	X	X	X	X	X	X	X		X	X
Digital topography– detailed or high-resolution	X	X	X	X	X	X	X	X	X	X
Maps (terrain, water features, geographic names)	X	X	X	X	X	X	X	X	X	X
Location of infrastructure, transportation routes	X	X	X	X	X	X	X	X	X	X
Exposure: structure inventory, engineering properties, response to hazards	X	X	X	X	X	X	X		X	X
Detailed bedrock geologic mapping, dating		X	X	X						
Detailed mapping, dating of surficial deposits, including fill, dumps		X	X	X	X			X	X	X
Documentation/ assessment of effects and area affected during and after event	X	X	X	X	X	X	X		X	X

	Wildland fire	Earthquakes	Volcanoes Volcanic ash	Landslides	Floods	Extreme weather	Tropical cyclones	Sea and Lake Ice	Coastal hazards, tsunami	Technological disasters, oil spills
Seismicity, seismic monitoring		X	X	X					X	
Strong ground shaking, ground failure, liquefaction effects		X		X					X	
Deformation monitoring, 3-D, over broad areas		X	X	X					X	
Strain and creep monitoring, specific features or structures		X	X	X						
High-resolution measurements of gravity, magnetic and electrical fields		X	X							
Physical properties of earth materials (surface and subsurface)		X	X	X					X	
Characterize regional thermal emissions, flux – all time scales	X	X	X							
Detect and characterize local thermal features at varying time scales	X		X							X
Characterize gas emissions by species and flux		X	X							X

	Wildland fire	Earthquakes	Volcanoes Volcanic ash	Landslides	Floods	Extreme weather	Tropical cyclones	Sea and Lake Ice	Coastal hazards, tsunami	Technological disasters (oil spills, etc.)
Detect and monitor smoke or ash clouds, acid and other aerosols	X		X							X
Water chemistry, natural and contaminated		X	X		X				X	X
Detect and monitor sediment, other discharges (oil, etc.) into water	X		X		X				X	X
Water levels (groundwater) and pore pressure		X		X	X					
Stream flow: stage, discharge and volume	X			X	X	X	X		X	X
Inundation area (floods, storm surge, tsunami)				X	X	X	X		X	X
Soil moisture	X	X		X	X	X	X		X	
Precipitation	X		X	X	X	X	X		X	X
Characterize snow cover or ice cover: area, concentration, thickness, water content, etc.				X	X	X		X		
Observe snow melt, ice break up, ice jams					X	X		X	X	
Navigational hazards or obstructions, including ice								X	X	

	Wildland fire	Earthquakes	Volcanoes Volcanic ash	Landslides	Floods	Extreme weather	Tropical cyclones	Sea and Lake Ice	Coastal hazards, tsunami	Technological disasters
Waves, heights and patterns (ocean, large lakes), currents						X	X	X	X	X
Tides/ coastal water levels					X	X	X	X	X	X
Wind velocity and direction, wind profile	X		X			X	X	X	X	X
Atmospheric temperature, profile	X					X	X	X		
Surface and near-surface temperature (ground, ice and ocean)	X	X	X	X		X	X	X		
Airmass differences and boundaries	X					X				
Moisture content of atmosphere	X		X			X	X			
Vegetation (high-resolution)	X			X	X					
Fuel characteristics: structure, load, moisture content	X									